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F.G.E., LTD.

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No. 60

Fewell Geotechnical Engineering, Ltd.
99-960A Iwaena Street, • Alea, Hawaii 96701 • (808) 488-1979

FOR REFERENCE

not to be taken from this room

File 315-2
December 3, 1981

Gray, Hong and Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Attention: Mr. Daniel Hong

Subject: **EARTHWORK MONITORING**
Halekou Road Subdivision
Kaneohe, Oahu, Hawaii

Gentlemen:

We have provided testing and monitoring services for the mass grading for the roadway and lots of the Halekou Road Subdivision presently under construction. This letter summarizes our test results and comments.

During July 1 through October 2, 1981, we observed the earthwork operations for the above-captioned project during forty-three site visits. Our observations, comments and test results have been reported in the previously transmitted Daily Field Report No's 1 through 43.

Field density tests performed by our firm indicate that adequate compaction has been obtained. The field test results are summarized on the enclosed Table I. These tests, upon which acceptance is based, show values generally in excess of 90 percent relative compaction within the building pads and a minimum of 95 percent relative compaction in the roadway subgrade, select borrow and base course materials. The maximum density was established in accordance with ASTM Test Designation D1557.

Our field monitoring indicates that the earthwork has been performed in accordance with our Subsurface Investigation Report of August 27, 1980 and the Grading Ordinances

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City & County of Honolulu
City Hall Annex, 558 S. King Street
Honolulu, Hawaii 96813

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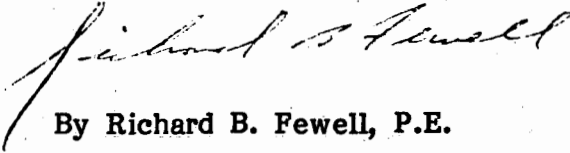
File 315-2
December 3, 1981

of the City and County of Honolulu. This includes the removal of the unsuitable import material as recommended in our September 9, 1981 letter. The material was removed from the roadway and replaced with select borrow.

If you have any questions, please do not hesitate to contact us.

Respectfully submitted,

FEWELL GEOTECHNICAL ENGINEERING, LTD.



By Richard B. Fewell, P.E.

RBF/fse

Enclosure

Copy to: GHS, Inc.
1305 South King Street
Honolulu, Hawaii 96814
Attn: Mr. George H. Sakoda

TABLE I
Summary of Field Density Test Results

Test No.	Date 1981	Location	Elevation (feet)	Dry Density (p.c.f.)	Moisture Content (%)	Percent Compaction	Remarks
1	7-8	STA 2+05	FSG-2.0	85	40	99	Pass
2	7-11	STA 2+75	FSG-1.0	87	39	100	Pass
3	7-9	Lot 2	FPG-2.5	81	40	95	Pass
4	7-9	Lot 1	FPG-1.5	83	40	96	Pass
5	7-13	Lot 1	FPG	83	40	98	Pass
6	7-13	STA 2+50	FSG	84	41	98	Pass
7	7-20	Lot 4	FPG-1.5	79	48	92	Pass
8	7-20	Lot 5	FPG-1.5	79	45	93	Pass
9	7-27	Lot 4	FPG-4.0	76	41	90	Pass
10	7-28	Lot 3	FPG-3.0	81	44	95	Pass
11	7-28	Lot 5	FPG-2.0	82	44	96	Pass
12	7-28	Lot 4	FPG-2.0	81	44	95	Pass
13	7-29	Lot 3	FPG-1.5	79	44	92	Pass
14	7-29	Lot 4	FPG-1.5	82	45	96	Pass
15	7-29	Lot 5	FPG	80	43	94	Pass
16	7-31	18" Drainline STA 5+15	FSG-1.0	75	39	88	Fail-see test 19
17	7-31	18" Drainline pass end of st.	FG -1.0	77	42	90	Pass
19	7-31	STA 4+60	FSG-1.0	82	40	95	Pass-retest of 16
20	7-31	18" Drainline pass end of st.	FSG-0.5	79	43	92	Pass
21	7-31	18" Drainline STA 5+25	FSG-0.5	83	43	97	Pass
22	7-31	18" Drainline STA 4+75	FSG	82	43	96	Pass
23	8-3	Lot 1	FG-4.5	84	43	99	Pass
24	8-3	Lot 1	FG-3.5	82	42	96	Pass
25	8-10	Lot 1	FG-3.5	80	43	93	Pass
26	8-10	Lot 1	FG-2.5	81	43	95	Pass
27	8-17	Lot 2	FPG-5.0	80	42	93	Pass
28	8-17	Lot 4	FPG-4.0	78	42	92	Pass
29	8-17	Lot 3	FPG-3.0	81	42	95	Pass
30	8-18	Lot 1	FPG-2.5	80	42	93	Pass
31	8-18	Lot 5	FPG-4.0	80	42	92	Pass
32	8-18	Lot 4	FPG-3.0	81	41	95	Pass
33	8-18	Lot 2	FPG-1.5	82	42	96	Pass
34	8-27	Lot 2	FPG-1.0	79	41	93	Pass
35	8-28	Lot 3	FPG-0.5	79	48	93	Pass
36	8-28	Lot 4	FPG-1.5	67	51	78	Fail-see test 49
38	9-1	Lot 1	FPG	81	39	95	Pass
39	9-18	STA 0+50	FSG	81	40	95	Pass
40	9-18	STA 1+85	FSG	83	37	97	Pass
41	9-21	STA 2+80	FSG	81	36	95	Pass
42	9-21	STA 3+50	FSG	81	39	95	Pass

TABLE I (cont)

Summary of Field Density Test Results

<u>Test No.</u>	<u>Date</u> 1981	<u>Location</u>	<u>Elevation</u> (feet)	<u>Dry Density</u> (p.c.f.)	<u>Moisture Content</u> (%)	<u>Percent Compaction</u>	<u>Remarks</u>
43	9-23	STA 2+20	Select Borrow	136	8	99	Pass
44	9-23	STA 1+00	Select Borrow	130	6	95	Pass
45	9-25	STA 5+00	Base course	140	4	98	Pass
46	9-25	STA 3+50	Base course	139	7	98	Pass
47	9-25	STA 2+25	Base course	135	10	95	Pass
48	9-25	STA 1+30	Base course	140	7	99	Pass
49	9-25	Lot 4	FPG-2.5	81	39	95	Pass-retest of 36
50	9-25	Lot 4	FPG-1.0	78	40	92	Pass-retest of 37
51	9-28	Lot 3	FG-0.5	73	38	86	Fail-see test 52
52	9-28	Lot 3	FG-0.5	75	40	89	Pass with additional compaction retest 51
53	9-30	Lot 2	FG	74	40	87	Fail-see test 57
54	10-2	Lot 4	FG	73	35	86	Fail-see test 57
55	10-2	Lot 3	FG	77	38	90	Pass
56	10-2	Lot 2	FG	73	40	88	Fail-see test 57
57	10-2	Lots 1-5	FG	76	35	90	Pass-retest of 53, 54, & 56

NOTE: FSG - Finish Subgrading
 FPG - Finish Pad Grade
 FG - Finish Grade

Test numbers 18 and 37 were deleted

File 315-2
 Halekou Road Subdivision
 Kaneohe, Oahu, Hawaii

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

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Engg

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
GARY K. WATANABE, PE

December 10, 1981

CP 9837

Mr. Michael Chun, Director
Department of Public Works
City & County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

SR-60

SUBJECT: Halekou Road Subdivision

Dear Mr. Chun:

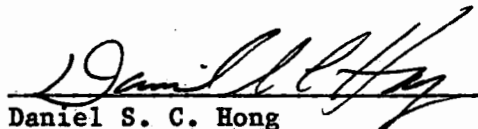
Attached herewith are 1) Grading Certification from Towill, Shigeoka & Associates, Inc. and 2) Final Soils Report from F.G.E., Ltd.

Based upon the above, we hereby state that to the best of our knowledge, the grading for the project has been completed substantially in accordance with the approved grading plan.

The As-Built Plans are being submitted under separate cover letter.

Very truly yours,

Gray, Hong & Associates, Inc.


Daniel S. C. Hong

DSCH:mp

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TOWILL, SHIGEOKA & ASSOCIATES, INC.

LAND SURVEYORS
850 RICHARDS STREET, SUITE 302
HONOLULU, HAWAII 96813

December 8, 1981

Mr. Danny Hong
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813


Dear Mr. Hong:

Subject: Halekou Road Subdivision
Halekou, Kaneohe, Koolaupoko, Oahu, Hawaii
Tax Map Key: 4-5-69: 29 and 31

We have completed final grade checks for Lots 1 to 16, incl., for the subject project and certify that all of the said Lots were graded according to the Grading Plan.

Sincerely yours,

TOWILL, SHIGEOKA & ASSOCIATES, INC.


Lester T. Shimabukuro
Vice President